SHORT STUDIES OF NORTH AMERICAN TRYXALINÆ.

By Samuel H. Scudder.

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The review of a large series of Tryxalinæ collected on the Pacific coast in 1897 by Mr. A. P. Morse, and kindly placed unreservedly in my hands, has provoked a re-examination of the species in a number of genera scattered through the group. I have published elsewhere (Can. Ent., XXXI. 177) a review of our species of Orphulella, and here gather together other miscellaneous studies, all referring to the Tryxalinæ.

1. The United States Species of Mermiria.

A recent study of our Mermiriæ has brought to light a couple of new species of Mermiria, and some slight extension of the known range of some of the other species, so that I venture to publish the following notes and descriptions, with a new table of the species, based primarily on that published by McNeill.

Table of the United States Species of Mermiria.

a^1. Head shorter than pronotum, or, if (rarely) as long, then the greatest width of the fastigium is greater than its length beyond narrowest part of vertex; last ventral segment of male bluntly acuminate.

b^1. Fastigium less prominent and blunter, its greatest breadth being considerably greater than its length beyond narrowest part of vertex, especially in the female.

c^1. Stouter, the hind femora shorter, not reaching the tips of the tegmina in the female; disk of pronotum, in female, hardly or not more than twice as long as greatest breadth; head with a broad occipital fuscous band.

texana Brun.

c^2. Slenderer, the hind femora longer, reaching the tips of the tegmina in the female; disk of pronotum distinctly, generally much, more than twice as long as greatest breadth; head with a narrow occipital band or none.

bivittata Serv.

b^2. Fastigium of vertex more prominent and angulate, its greatest breadth being scarcely greater, even in the female, than its length beyond narrowest part of vertex; disk of pronotum considerably more than twice as long as greatest breadth . . . . . *intertexta* sp. nov.

a^2. Head as long as pronotum; fastigium at least as long beyond narrowest part of vertex as its extreme breadth; last ventral segment of male more produced and somewhat acutely acuminate.

b^1. Head with a relatively narrow or no occipital median fuscous stripe, which never nearly equals the width of the fastigium.

c^1. Fastigium triangular, the sides converging in a nearly straight or only slightly curved line, the tip narrowly rounded . . . . . *alacris* Scudd.

c^2. Fastigium semielliptical, the sides converging with a well rounded curve, the tip very broadly and bluntly rounded . . . . . *neomexicana* Thom.

b^2. Head with a broad fuscous occipital stripe, almost or quite as broad as the greatest width of the fastigium.

c^1. Fastigium semielliptical and strongly rounded apically, the sides well curved . . . . . *vigilans* sp. nov.

c^2. Fastigium acutely triangular, with the sides straight and the tip hardly blunt . . . . . *rostrata* McNeill.

Mermiria texana Brun.

I have seen no male of this species. My specimens come from Colorado, 7000′, Morrison, and Coahuila, Mex., Palmer. It was originally described from Texas and the State of Durango, Mex. McNeill also credits it to Arizona.

Mermiria bivittata (Serv.).

I am inclined to think that Bruner's *M. maculipennis* must be regarded as at most only a variety of this species; I have seen it from Texas and Colorado only, and all are females. McNeill accepted it with doubt, and my maculate specimens, including one named by Bruner, vary in the breadth and arcuation of the fastigium to the same extent as do those undoubtedly to be referred to *bivittata*.

This is our commonest species, and is wide spread. From east of the Mississippi I have specimens from Georgia only, but numerous specimens from Nebraska, Kansas, Colorado, Utah, Arizona, New Mexico, and Texas, and some immature specimens, which may belong here, from Iowa, collected by Allen. McNeill also credits it to Virginia, Illinois, and Nevada. Morse found it common in New Mexico on bunch grass, but it was rather shy and flew freely.

Mermiria intertexta sp. nov.

In color, markings, and size this species exactly resembles the preceding; in all specimens seen, however, there is a slender mediodorsal fuscous stripe on head and pronotum. The head is distinctly shorter than the pronotum, and the fastigium in both sexes is scarcely broader

than its length beyond the narrowest part of the vertex, being triangular (♂) or subtriangular (♀), with straight (♂) or arcuate (♀) sides and blunt apex, the margins slightly ascending, and with faint or no median carina. The median carina of the pronotum is pronounced throughout, the lateral carinæ feeble, and the disk of the pronotum considerably more than twice as long as broad, especially in the male, the transverse sulci rather feebly impressed. The tegmina reach about to the tip of the abdomen and are immaculate, with the base of the median area infuscated and bordered by a submarginal costal flavous streak, as frequently in *M. bivittata*. The hind femora are slender, and reach as far back as the tegmina in both sexes. Last ventral segment of male a little more elongate and gradually acuminate than in *M. bivittata*.

Length of body, ♂, 38 mm., ♀ 56 mm.; pronotum, ♂, 6 mm., ♀, 8.5 mm.; tegmina, ♂, 27 mm., ♀, 39 mm.; hind femora, ♂, 21.5 mm., ♀, 31 mm.

2 ♂, 2 ♀. Georgia, Morrison; Eagle Pass, Tex., Schott.

Mermiria alacris Scudd.

I have seen specimens only from Georgia, Morrison; Sandford, Fla., Frazer; and Dallas, Tex., Boll.

Mermiria neomexicana (Thom.).

My specimens come only from Pueblo, Col., Aug. 30, 31; Dallas, Boll, and Bosque Co., Tex., Belfrage. McNeill says it occurs from Wyoming to New Mexico and eastward to Georgia. I suspect his Georgia reference may be due to my remarks in describing *M. alacris*, where I speak of the present species as occurring in Georgia, but I now think that was a mistake.

Mermiria vigilans sp. nov.

Dull olivaceous with purplish and flavous markings, particularly the former. The head has a broad mediodorsal purplish fuscous stripe, broadening a little in passing backward, and as broad, at least posteriorly, as the fastigium; this is separated by a narrow flavous stripe from a broad and equal light purplish postocular stripe which continues over the upper part of the lateral lobes of the pronotum; below this the genæ are olivaceous clouded with flavous, while the face is infuscated. The pronotum is dull flavo-olivaceous, the disk often with a faint purplish median stripe, and the lateral lobes narrowly margined below with

purplish, the latter color in the male often suffusing the whole; tegmina green, the median area, especially near base, more or less ferruginous; hind femora flavous, infuscated above; hind tibiæ dull red.

Fastigium distinctly longer beyond the narrowest part of the vertex than the extreme breadth, semielliptical, the sides straighter in the male than in the female, very bluntly rounded at tip, especially in the female, the margins scarcely ascending but plane, while the centre is rotundate with no sign of median carina. Disk of pronotum about twice as long as broad, the median carina sharp throughout, the lateral carinæ distinct but not elevated, the posterior margin very broadly rounded. Tegmina reaching the tip of the abdomen. Hind femora very slender, reaching the tip of the tegmina. Last ventral segment of male short but unusually acuminate.

Length of body, ♂, 36 mm., ♀, 48 mm.; pronotum, ♂, 5 mm., ♀, 7.25 mm.; tegmina, ♂, 25 mm., ♀, 36 mm.; hind femora, ♂ 20 mm., ♀, 26 mm.

2 ♂, 4 ♀. Smithville, N. C., Nov. 22.

In markings this species seems to bear a close resemblance to *M. rostrata*, which I have not seen, but differs from it as it does from *M. alacris* in the form of the fastigium. It is most closely allied structurally to *M. neomexicana*, but has a longer pronotum and a more pointed genital segment in the male, while it differs to a considerable degree in color and markings; these, however, are variable in both species.

Mermiria rostrata McNeill.

This species, known only from Indian Territory, I have not seen.

2. Acentetus and its Species.

This genus was founded by McNeill (Proc. Dav. Acad. Nat. Sc., VI. 225) on *Acentetus unicolor*, a species described by him in the same paper from a single male without antennæ, taken in Colorado. I have a single male of the same species, taken by me at Lakin, Kansas, on Sept. 1, which agrees with McNeill's figures and description except that the whole upper surface of the head and pronotum is blackish fuscous, the genæ are narrowly striped with pale flavous or luteous and pale fuscous, and the lateral lobes have similar luteous stripes on a pale fuscous ground; the contrast of the dark disk and lighter lateral lobes does not well suit the name *unicolor*. The antennæ, the description of which had of course to be omitted from the generic characters, are depressed subfiliform, not

tapering, and distinctly longer than head and pronotum together. The scapular area of the tegmina, as represented in McNeill's figure, is too narrow; at its widest, opposite the nexus of veins in the median area, it is nearly one third the total width of the tegmina at this point.

I have a second species of Acentetus, also represented by a single male and also without antennæ, taken by me at Florissant, Col., Aug. 17–22. It is testaceous, marked with griseous and fuscous; the head is testaceous, with a pair of narrow, arcuate, diverging, fuscous occipital stripes, and on each side a pair of similar but straight postocular stripes; the disk of the pronotum is griseous and the lateral lobes testaceous below, passing rather rapidly into blackish fuscous above; the hind femora are testaceous, more or less infuscated but not at all banded, and rufous beneath, the hind tibiæ dull red. Length of body, 16.5 mm.; tegmina, 10.5 mm.; hind femora, 10.5 mm.

It differs from *A. unicolor* not only in color and markings, but also in several structural peculiarities: The median carina of the fastigium is less pronounced and indeed rather feeble; the lateral carinæ of the pronotum, though having much the same divergence, are continuous and equal throughout, thus requiring a modification of the generic definition as given by McNeill; the metazona is much more coarsely and deeply punctate; and the tegmina (in the male of course) have a very different form, the costa being very strongly arched in the distal half and the distal portion of the tegmina being much abbreviated, so that the tegmina as a whole are less than three times longer than broad, instead of five times as long as broad, as in *A. unicolor;* the relative breadth of the scapular area is even greater than in that species. It may be called *Acentetus carinatus.*

3. A Second Species of Opeia.

Opeia was founded by McNeill in 1897 (Proc. Dav. Acad. Nat. Sc., VI. 214) upon a single species, *Oxycoryphus obscurus* Thom. I have seen numerous specimens of this species coming from the Yellowstone valley in Montana, Nebraska, Lakin, Kans., Sept. 1 (Scudder), Colorado, 5500′, 7000′ (Morrison), Ft. Collins, Col., Aug. 12, 25, "on *Bouteloua oligostachya*" (Baker), Garden of the Gods, Col. (Scudder), Silver City, N. Mex. (Bruner), and Bosque Co., Tex., "on prairies" (Belfrage), as well as from Ft. Whipple, Arizona (Palmer). According to McNeill it is "a species peculiar to the Great Plains."

In 1897, Mr. A. P. Morse brought a second species from California.

— Lancaster, Aug. 1, Kern City, Aug. 4, Tulare, Aug. 5, and Lathrop, Aug. 17 (25 ♂, 17 ♀), which may be called *Opeia testacea.*

It is a slenderer insect with longer tegmina, which equal (♀) or surpass (♂) the abdomen and reach the base of the geniculation of the hind femora, and with a paler, nearly uniform coloring with scarcely any green in it, and immaculate tegmina in the female, where at most they merely have an obscure unbroken fuscous streak in the proximal half of the median area, while in *O. obscura* the female tegmina have the median area nearly always distinctly marked with fuscous, broken into quadrangular spots; in the latter species the upper half of the lateral lobes is generally marked with a broad or narrow fuscous (rarely greenish) stripe, in both sexes, extending in extreme cases upon the head as a postocular band; this is extremely rare in *O. testacea* and obscure at best, though the lateral lobes are occasionally infuscated as a whole; generally the whole pronotum is uniform pale testaceous; the hind tibial spurs are more slender in the new species, and the face a little more oblique in both sexes. Measurements of average specimens are as follows. Length of body, ♂, 14 mm., ♀, 25.5 mm.; antennæ, ♂, 5.75, ♀, 8.9 mm.; tegmina, ♂, 9.5 mm,, ♀, 15.5 mm.; hind femora, ♂, 9.4 mm., ♀, 15.6 mm.

Other species occur in Northern Mexico, which appear to be undescribed.

4. A New Genus of Orphulæ.

Among the Orthoptera brought by Mr. Morse from the Pacific coast is a new form of Orphulæ nearly allied to Chloealtis. Our genera of Orphulæ may be thus separated.

Table of the United States Genera of Orphulæ.

a^1. Antennæ relatively short, at most but little longer than head and pronotum together; scapular area of tegmina not specially dilated.

b^1. Foveolæ of vertex more or less evident; prozona not much longer than metazona; lateral lobes of pronotum transverse, that is, deeper than long; upper ulnar vein of tegmina, at least in male, apically joining the lower ulnar vein at a long distance beyond the end of the basodiscoidal field . . . *Orphulella* Stål.

b^2. Foveolæ of vertex wanting; prozona very much longer than metazona; lateral lobes of pronotum longitudinal, longer than or fully as long as deep; upper ulnar vein of tegmina, at least in male, apically strongly arched, joining the lower ulnar vein not far beyond the end of the basodiscoidal field.

c^1. Lateral lobes of pronotum plane above, meeting the disk at nearly right angles; lateral carinæ parallel throughout; tegmina usually much shorter than the abdomen in both sexes . . . . . *Dichromorpha* Morse.

c^2. Lateral lobes of pronotum convex above, except for the carinæ passing rather gradually into the disk; lateral carinæ divergent on metazona; tegmina nearly or quite as long as the abdomen, at least in the male.

Clinocephalus Morse.

a^2. Antennæ long, about or more than half as long again as head and pronotum together; fastigium of vertex with a median carina; scapular area of tegmina distinctly dilated, at least in the male.

b^1. Antennæ basally depressed but not expanded, subequal to near the tip; face moderately oblique, the frontal costa subobsolete below the ocellus; lateral foveolæ of vertex obsolete; pronotum posteriorly truncate, the lateral lobes as deep as long . . . . . *Chloealtis* Harr.

b^2. Antennæ basally depressed and expanded, tapering in the proximal half; face strongly oblique, the frontal costa percurrent and sulcate below the ocellus; lateral foveolæ of vertex distinct, linear; pronotum posteriorly obtusangulate, the lateral lobes longer than deep . . . . . *Œonomus* gen. nov.

Œonomus (*οἰονόμος*) gen. nov.

Of slender form. Head somewhat prominent, subconical, the face strongly oblique; fastigium of vertex triangular with rounded subrectangulate apex, plane above with feebly raised blunt margins and a median carina, the lateral foveolæ distinct, linear, invisible from above; frontal costa percurrent or almost percurrent, sulcate except in the uppermost subvertical portion; eyes long-oval, oblique, not distant above; antennæ half as long again as head and pronotum together in the male, nearly as long as that in the female, the proximal half beyond the second joint depressed, expanded and tapering, in the male broader, at broadest, than the interspace between the eyes, at extreme tip again tapering slightly, at least in the male. Pronotum compressed, the disk nearly plane, faintly tectate, with parallel sides, the lateral and median carinæ similar and parallel, the front margin gently convex, the hind margin broadly obtusangulate, the lateral lobes vertical but gently rounded, longer than deep. Tegmina shorter than the body, apically subangulate, the scapular area expanded and scalariform in the male; wings aborted. Hind legs slender, the femora surpassing the abdomen, the inner spurs of hind tibiæ equal.

Œonomus altus sp. nov.

Testaceous with a lateral blackish fuscous stripe of variable width, but generally broad and deepest in color above, extending from behind the eyes across the pronotum, limited above by the lateral carinæ and continued upon the closed tegmina; otherwise devoid of markings except usually for a pair of feeble and obscure diverging fuscous stripes on the

vertex, and that the antennæ are generally much infuscated. Vertex well rounded, slightly ascending; frontal costa sparsely and irregularly punctate; eyes a little shorter, especially in the female, than the infraocular portion of the genæ. Pronotum with sharp and distinct carinæ, the prozona generally impunctate except anteriorly and delicately, the transverse sulci feeble, the principal sulcus angulate, especially in the female, and situated distinctly behind the middle, the metazona densely and rather finely punctate. The fuscous portion of the tegmina involves the front margin of the discoidal area, but in the male leaves the distal expanded half of the scapular area untouched, and in one female the discoidal area is sparsely punctate with fuscous; they are usually about as long as the hind femora, but in the female are sometimes no longer than head and pronotum together. Hind femora very slender, at least equalling (♀) or considerably surpassing (♂) the abdomen; hind tibiæ red, occasionally infuscated apically.

Length of body, ♂, 18 mm., ♀, 24 mm.; antennæ, ♂, 9 mm., ♀, 8.5 mm.; tegmina, ♂, 9.5 mm., ♀, 9 mm.; hind femora, ♂, 11 mm., ♀, 14.5 mm.

15 ♂, 9 ♀. Mt. Wilson, Altadena, Cal., 2400′, July 27, A. P. Morse.

5. A New Genus of Stenobothri.

The North American Stenobothri may be separated as follows: —

a^1. Antennæ not apically clavate.

b^1. Face considerably oblique, straight or little rounded; lateral foveolæ of vertex slender; lateral lobes of pronotum longer than or fully as long as deep.

c^1. Fastigium with a distinct percurrent median carina; antennæ, at least in female, depressed and more or less expanded basally.

d^1. Antennæ much expanded basally, tapering, in the male as long as the hind femora; lateral carinæ of pronotum subparallel, the disk subrectangular; prosternum tuberculate, especially in the male; tegmina shorter than the abdomen . . . . . *Napaia* McNeill.

d^2. Antennæ feebly expanded basally, subfiliform, much shorter than the hind femora; lateral carinæ of pronotum strongly sinuate, the disk clepsydral; prosternum not tuberculate; tegmina longer than the abdomen.

Horesidotes gen. nov.

c^2. Fastigium with no median carina, but at most a colored line, except sometimes in extreme anterior portion; antennæ filiform, the basal joints neither expanded nor greatly depressed in either sex; disk of pronotum clepsydral.

Stenobothrus Fisch.

b^2. Face little oblique, strongly rounded; lateral foveolæ of vertex moderately broad, never more than twice as long as broad; lateral lobes of pronotum deeper than long.

c^1. Hind margin of pronotum more angulate than front margin; posterior margin of lateral lobes straight; tegmina and wings fully developed.
Platybothrus Scudd.

c^2. Fore and hind margins of pronotum equally (and slightly) angulate; posterior margin of lateral lobes sinuate; tegmina abbreviate and wings aborted.
Bruneria McNeill.

a^2. Antennæ apically clavate . . . . . *Gomphocerus* Thunb.

Horesidotes (ὡρεσιδώτης) gen. nov.

Allied to Napaia McNeill (which I have not seen) and separable from it in the points mentioned in the above table. Head subpyramidal, the face considerably oblique and straight; occiput with a median carina extending to and invading the fastigium of the vertex and throughout accompanied proximately by a pair of similar supplementary carinæ; foveolæ visible from above, elongate, shallow; eyes rather elongate; antennæ subfiliform, a little depressed but only feebly expanded basally, moderately slender, a little longer than head and pronotum together in both sexes but especially in the male, and much shorter than the hind femora. Pronotum rather small, the disk markedly clepsydral, the lateral carinæ being strongly arcuate and as distinct as the median carina; prozona and metazona of subequal length, the hind margin rounded obtusangulate; lateral lobes slightly longer than deep; prosternum not tuberculate. Tegmina extending beyond the abdomen, without intercalary vein, the apical portion of the scapular field expanded in the male. Inner calcaria of hind tibiæ subequal.

Horesidotes cinereus sp. nov.

Varying greatly from light testaceous with a slight olivaceous tinge and very feeble markings to dark cinereous with heavy markings, which in some females includes a broad median testaceous stripe on head and pronotum, bordered on the latter by a velvety black stripe cut by the luteous lateral carinæ; but in others these markings are wholly wanting, the disk and tegmina are dark cinereous flecked with griseous, and the lateral lobes are marked with a broad postocular blackish fuscous stripe extending to the eyes and separated sharply and angularly from the clay-yellow of the lower portion of the lobes. Similar differences occur in the males, and there are also some of each sex in which all markings are but faintly indicated. The antennæ are light castaneous, the wings are feebly infumate apically with black veins, and the hind femora are of the color of the upper surface, but where this is light, the upper outer carina is often marked with black; hind tibiæ glauco-luteous.

Length of body, ♂, 14.5 mm., ♀, 24.5 mm.; antennæ, ♂, 6.25 mm., ♀, 8.75 mm.; tegmina, ♂, 12 mm., ♀, 19 mm.; hind femora, ♂, 10 mm., ♀, 15.5 mm.

19 ♂, 11 ♀. Palm Springs, Cal., July 13, A. P. Morse. It occurred on grasses in dry places in Palm Cañon and West Cañon.

6. The American Species of Stenobothrus.

I have numerous specimens of Stenobothrus from west of the Mississippi and east of the Sierra Nevadas, including Dallas Co., Iowa (Allen), Nebraska (Dodge), Colorado, 5500′ and 8000′ (Morrison). Ft. Collins, Col. (Baker), Morris Ranch, Larimer Co., Col., 8500′ (Baker), Garland Col., Aug. 28–29 (Scudder), Salt Lake Valley, Utah, Aug. 1–4 (Scudder), Spring Lake Villa, Utah Co., Utah (Palmer), and Yellowstone Park, Sept. 6–12 (Scudder). These agree perfectly with eastern examples, and do not have in any case all of the characters on which McNeill separates *S. coloradensis*, on the basis of a single female specimen from Ft. Collins, Col. All the points on which he separates this species vary to a certain extent, except perhaps the length of the antennæ (in which he may have been mistaken if the antennæ were curled), and I am therefore inclined to think that *S. coloradensis* must be placed as a synonym of *S. curtipennis*. My Yellowstone Park specimens, all males, are of a smaller size than is usual; while specimens collected by R. Thaxter in sphagnum bogs at Salmonier, Newfoundland, Aug. 1–15, are unusually green and have a very peculiar aspect, but I have not discovered any good specific distinction from *S. curtipennis*.

On the other hand, Mr. A. P. Morse brought home from Oregon (Corvallis, Cordley, Portland, Sept. 18, Divide-Cottage Grove, Sept. 12, Drain, Sept. 11, Roseburg, Sept. 10, Glendale, Sept. 9, Grant's Pass, Sept. 8, and Ashland, Sept. 7), and California (Gazelle, Sept. 5, Sisson, Aug. 29, Baden, Aug. 24, Berkeley, Aug. 21, and San Francisco, Aug. 19), numerous specimens of a closely allied but more heavily marked species, which seems to be distinct and may bear the name *Stenobothrus oregonensis*. As compared with *S. curtipennis* the antennæ of the male are shorter than, instead of as long as, the hind femora, the middle joints narrower than the narrowest part of the frontal costa, instead of being at least as broad as it; the fastigium of the vertex has a distinct median carina in the anterior portion wanting or hardly discernible in *S. curtipennis*; the disk of the metazona is marked distinctly and generally broadly at the sides with black, instead of being generally immaculate or narrowly mar-

gined with black laterally; the male tegmina are shorter, generally much shorter than the abdomen, with rare exceptions as long as the abdomen, instead of being at least as long as, in macropterous forms considerably longer than the abdomen, the vena plicata joining the vena dividens before the middle or fading at some distance before the middle, instead of running free past the middle of the tegmina. In general it is more heavily marked, has shorter tegmina and slenderer antennæ. In the female the tegmina are but little longer than the head and pronotum together, sometimes no longer. It should at least be distinguished as a race; future collections in the intermediate regions will probably show more clearly whether it should be regarded as wholly distinct.

7. Psoloessa and Stirapleura.

In his Revision of the North American Tryxalinæ (Proc. Dav. Acad. Sc., VI.), McNeill placed these two genera side by side at the end of his series. Later, in my Preliminary Classification of the same subfamily (Psyche, VIII.), I placed them at some distance apart, Psoloessa among the Phlibostromæ and Stirapleura in the Scyllinæ. This change of mine was wrong and came from incorrect observation of the foveolæ of the vertex (a distinction on which I placed a wider reliance than McNeill), for in Psoloessa they are partially visible from above, their plane being twisted feebly in relation to that of the margin of the vertex, so that while they are visible from above on their inner half, they are not so on their outer half. The other features of Psoloessa show that it belongs to the Scyllinæ, and I would restore it to the immediate vicinity of Stirapleura, to which it is very closely allied.

The table given by me for the separation of the genera of Scyllinæ may be altered by substituting the following for the final paragraph relating to Stirapleura (Psyche, VIII. 231): —

Pronotum constricted in the middle, the prozona slightly the shorter; lateral carinæ percurrent, more or less divergent in front and strongly divergent behind.

Foveolæ of vertex visible from above only on the inner half; lateral carinæ of pronotum anteriorly but little or at least not strongly divergent, being gently arcuate on the prozona; lateral lobes of prozona feebly or not marked above the middle with obliquely disposed short lunate carinules . . . *Psoloessa* Scudd.

Foveolæ of vertex visible from above throughout their length; lateral carinæ of pronotum very strongly divergent in front as well as behind, being strongly bent-arcuate on the prozona; lateral lobes of prozona more or less conspicuously rugose-carinate obliquely above the middle . . . . . *Stirapleura* Scudd.

This definition will leave *P. texana* Scudd. in Psoloessa, instead of transferring it to Stirapleura, as was done by McNeill, doubtless on account of the slightly more marked oblique carinæ of the lateral lobes of the pronotum. The face is generally a little more oblique in Psoloessa than in Stirapleura, but the distinctions drawn by McNeill from the frontal costa hold in Psoloessa only for *P. buddiana* Brun.

As to the species of Stirapleura, I am inclined to look on the form from southern California, heretofore regarded as identical with *S. delicatula* (Scudd.) of Colorado to be distinct from though closely allied to it. I have before me a considerable series (more than a hundred) of each, and I find the Californian species to have a slenderer form, longer tegmina and wings, and the upper inner angle of the lateral foveolæ of the vertex distinctly more rounded so as to make them less distinctly rhomboidal than in *S. delicatula*. I describe it herewith, together with another new species from Texas, remarkable for the delicacy of the lateral carinæ of the pronotum and approaching Psoloessa in the feebleness of the oblique carinæ of the lateral lobes.

Stirapleura pusilla sp. nov.

Head moderately prominent, subascending, the fastigium of the vertex rather deeply sulcate with elevated, anteriorly acutangulate margins; lateral foveolæ nearly or quite half as long again as greatest breadth, subrhomboidal, but narrower interiorly than exteriorly, with the inner upper angle distinctly rounded; frontal costa much contracted at summit, more or less gradually broadening, sulcate throughout but only feebly at base, punctate within the raised and smooth margins; antennæ distinctly but not greatly longer than head and pronotum together, especially in the male. Pronotum considerably constricted mesially, the posterior margin obtusangulate, the median carina moderately prominent, equal, cut barely in advance of the middle, the lateral carinæ equally prominent, bent-arcuate and strongly divergent, especially behind, so that the disk of the pronotum is about twice as broad posteriorly as near the middle, the lateral lobes more or less corrugated at the shoulder just below the lateral carinæ. Color cinereous, generally much marked with fuscous and black, paler beneath than above, but very variable; face generally testaceous, the frontal costa more or less infuscated, the genæ generally dotted with fuscous or infuscated, sometimes with the exception of a broad arcuate oblique subocular stripe; the occiput may or may not be striped with testaceous and fuscous, but there is usually a broad postocular fuscous stripe extending across the lateral lobes, where it is often followed below

by a testaceous stripe, below which the lateral lobes are again infuscated, but often enlivened below the middle posteriorly by a more or less conspicuous oblique flavo-testaceous bar, sometimes merged in the lighter color of the lowest portion; disk of pronotum testaceous more or less infuscated, the carinæ usually flavous and the metazona with a triangular black patch on either side. Tegmina surpassing the hind femora in both sexes, more or less heavily flecked with fuscous, ranging from a nearly uniform sprinkling throughout with fuscous dots to a regular series of six or more quadrate fuscous blocks in the median area; wings hyaline with black veins. Hind femora considerably surpassing the abdomen, cinereous or cinereo-testaceous, generally marked above with a median triangular black-edged brown spot and often also with less conspicuous basal and postmedian fuscous patches, the geniculation more or less infuscated; hind tibiæ pallid with a glaucous tinge and generally flecked more or less conspicuously with fuscous, the base with a postgenicular infumated annulus, the spines black-tipped.

Length of body, ♂, 10.5 mm., ♀, 18 mm.; antennæ, ♂, 5.2 mm., ♀, 6.5 mm.; tegmina, ♂, 10.5 mm., ♀, 15 mm.; hind femora, ♂, 8.5 mm., ♀, 12.75 mm.

89 ♂, 80 ♀. Mesilla, N. Mex., July 1 (Morse); and the following from California: San Diego, July 22 (Morse); Coronado, July 24 (Morse); San Bernardino, July 16 (Morse); Cahon Pass, July 18 (Morse); Los Angeles, July 21 (Morse), Oct. 24 (Scudder); Altadena, July 29, and Mt. Wilson, 2400′, July 27 (Morse); Pasadena, Oct. 23 (Scudder); Santa Barbara, Oct. 21 (Scudder); Lancaster, July 31, Aug. 1 (Morse); Tehachapi, Aug. 2 (Morse); Kern City, Aug. 4 (Morse); Tulare, Aug. 5 (Morse); Monterey, Oct. 18 (Scudder); Raymond, Aug. 16 (Morse), and Ahwanee, Aug. 15 (Morse).

At Mesilla, Mr. Morse found this insect common on sand and gravel on the mesa, scarce on weeds and tall grass along ditches.

Stirapleura tenuicarina sp. nov.

Head not very prominent, the fastigium of the vertex moderately narrow, deeply sulcate with elevated margins acutangulate in front; lateral foveolæ almost exactly quadrate, barely longer than broad, distinctly impressed; frontal costa pinched above, gradually enlarging throughout and sulcate, though scarcely so at base and directly above the ocellus, very sparsely punctate; antennæ a little shorter than head and pronotum together. Pronotum not greatly constricted mesially, the posterior margin broadly obtusangulate, a little rounded, the median

carina only slightly prominent, equal, cut distinctly in advance of the middle, the lateral carinæ delicate, feebly elevated, briefly parallel just in front of the middle, but widely divergent in advance, as behind; lateral lobes with subdued corrugations at the shoulder just below the lateral carinæ. Color fusco-cinereous, the head testaceous with pallid genæ, plumbeo-fuscous above; antennæ testaceous interrupted with fuscous; pronotum nearly uniform obscure fusco-testaceous, the carinæ concolorous; tegmina cinereous much flecked with fuscous especially in quadrate patches along the median area, one beyond the middle larger than the rest and divided by an oblique pallid bar; wings hyaline with black veins; hind femora cinereo-testaceous with a ferruginous tinge and blotched with fuscous, above rather obscurely trimaculate with fuscous; hind tibiæ pale ferrugineo-luteous, deepening in tint distally.

Length of body, 22.5 mm.; antennæ, 5.75 mm.; tegmina, 19.5 mm.; hind femora, 13.75 mm.

1 ♀. Sierra Blanca, El Paso Co., Tex., June 26, A. P. Morse.

8. The Species of Aulocara.

Aulocara Scudd. has as synonyms Œdocara Scudd. and Coloradella Brunn. (See Can. Ent., XXIX. 75, and Psyche, VII. 71.) No species have been referred to the last named, but to the others five nominal species have been referred; *elliotti* Thom., *cæruleipes* Scudd., *decens* Scudd., *strangulatum* Scudd., and *scudderi* Brun. *Scudderi*, as has been shown by McNeill, belongs to Ageneotettix (Eremnus). The other four all represent a single species, which must bear the oldest name, *elliotti*. Nevertheless we possess four species which may be separated by the following table: —

Table of the Species of Aulocara.

a^1. Fastigium of vertex broader than long, its front margin obtusangulate; metazona feebly tumescent, its hind margin not very broadly obtusangulate; hind tibiæ red . . . . . *rufum* sp. nov.

a^2. Fastigium of vertex at least as long as broad, its front margin rectangulate or acutangulate; metazona plane or nearly plane, its hind margin broadly obtusangulate; hind tibiæ purple,* or glaucous.

b^1. Pronotum strongly constricted mesially, the disk with more or less conspicuously decussate markings, the lateral carinæ strongly divergent in front and behind.

c^1. Male antennæ as long as thorax and abdomen combined; lower margin of lateral foveolæ of vertex obsolete or obsolescent; tegmina generally immaculate, much shorter than the long hind femora . . . . . *femoratum* sp. nov.

* The hind tibiæ of *A. parallelum* are not known, but are presumably purple.

c^2. Male antennæ shorter than thorax and abdomen combined; lower margin of lateral foveolæ of vertex distinct; tegmina generally maculate, generally fully as long as the relatively shorter hind femora . . . . . *elliotti* Thom.

b^2. Pronotum but feebly constricted mesially, the disk of subequal width and unicolorous, the lateral carinæ divergent only, and but little, behind.

parallelum sp. nov.

Aulocara rufum sp. nov.

Head well rounded, rather large, ferrugineo-cinereous, paler on face, with a pair of obscure fuscous stripes on summit and more or less flecked with fuscous or ferruginous on upper part of genæ; summit tumid, the fastigium much broader than long, with slightly raised, parallel lateral margins, the front margin distinctly obtusangulate; lateral foveolæ obsolescent, scarcely impressed, subtriangular, longer than broad; frontal costa of moderate breadth, subequal but feebly narrowed above, obsolescent below with slightly and narrowly elevated margins; antennæ ferruginous, more or less infuscated, in the male as long as the hind femora. Pronotum nearly uniform rufous, more or less infuscated on disk, especially on metazona, not greatly constricted mesially, the metazona feebly tumescent, the hind margin a little obtusangulate, the angle sometimes much rounded, the median carina slight and confined to the metazona. Tegmina broad and well rounded, rufous, minutely sprinkled with fuscous, hardly surpassing the hind femora; wings hyaline, the veins glaucous, sometimes infuscated. Hind femora cinereo-testaceous, often more or less ferruginous, generally very obscurely (but occasionally in male distinctly) bifasciate with fuscous; hind tibiæ light red, pallescent basally.

Length of body, ♂, 14 mm., ♀, 19 mm.; antennæ, ♂, 8 mm., ♀, 8.75 mm.; tegmina, ♂, 11.5 mm., ♀, 15.5 mm.; hind femora, ♂, 8 mm., ♀, 12 mm.

5 ♂, 4 ♀. Pueblo, Col., July 8–9, Aug. 30–31.

This species is very distinct from all the others, not only in the coloring of the body, tegmina, and hind tibiæ, but in the breadth of the fastigium of the vertex, the obscurity of the foveolæ, the absence of a median carina on the prozona, and the lesser obtuseness of the hind margin of the metazona.

Aulocara femoratum sp. nov.

Of minor size, the head well rounded and rather prominent, cinereo-testaceous, a little infuscated above; summit tumid, the fastigium deeply excavate, considerably longer than broad, the margins rather sharply elevated, the lateral parallel, the front acutangulate; lateral foveolæ triangular, of moderate size, distinctly impressed, but with obsolescent or no

inferior margin; frontal costa rather narrow, subequal but slightly compressed above, obsolete below, more or less but generally feebly sulcate; antennæ testaceous, infuscated except near base, of unusual length though not quite so long as the long hind femora. Pronotum testaceous, the disk somewhat infuscated, considerably constricted mesially, the lateral lobes with a large and distinct, quadrate, subcentral but superior, fuscous patch, the metazona plane, the hind margin subtruncate but feebly angulate, the median carina distinct, equal, percurrent, the lateral carinæ blunt and obscure except where marked with pale testaceous, strongly divergent in front and behind. Tegmina short and well rounded, when closed not nearly covering the abdomen, testaceous, sometimes feebly infuscated or minutely and obscurely flecked with fuscous; wings hyaline with glaucous veins. Hind femora of unusual length, much surpassing the abdomen, testaceous, obliquely biannulate with blackish fuscous, the geniculation broadly black; hind tibiæ glaucous, basally pallescent.

Length of body, 15 mm.; antennæ, 9.5 mm.; tegmina, 7.5 mm.; hind femora, 10.75 mm.

5 ♂. Lakin, Kans., Sept. 1; Colorado, 5500′, Morrison; Pueblo, Col., Aug. 30–31; Provo, Utah, Aug. 23–24.

I have based this species upon the male specimens just quoted, but I have also three females from Lakin and Pueblo, with short wings and long hind femora, which I think belong here, but which resemble *A. elliotti* more than do the males. The species is smaller than any of its congeners, with shorter wings, longer hind femora, and subtruncate posterior margin of the pronotum.

Aulocara elliotti.

Stauronotus elliotti Thom., Proc. Acad. Nat. Sc., Philad., 1870, 82 (1870).
Œdocara elliotti Sauss., Prodr. Œdip., 79 (1884).
Aulocara elliotti Brun., Can. Ent., XVII. 10 (1885).
Aulocara cæruleipes Scudd. !, Bull. Hayd. Surv., II. 266 (1876).
Aulocara decens Scudd. !, Ibid., II. 267 (1876).
Œdocara strangulatum Scudd. !, Ann. Rep. Wheel. Surv., 1876, 289 (1876).

I have specimens, mostly collected by myself, from Kansas (Lakin, Sept. 1); Colorado (southern Colorado, June 11–20, Carpenter; Animas, July 8–9; Granada, July 8–9; Pueblo, July 8–9; Garden of the Gods, July 13, Packard; Florissant, Aug. 17–22); Texas (Fort Worth, July 4); New Mexico (Johnson's Basin, June 22, Townsend); Arizona (Fort Whipple, Palmer); Utah (Castle Gate, Aug. 22; Lake Point, Salt Lake, July 26, Packard; Salt Lake valley, Aug. 1–4); and Cali-

fornia (Tehachapi, Aug. 2, A. P. Morse, the last of an unusually large size); also mountains 12 leagues east of San Luis, Mexico, E. Palmer.

It has also been credited to Nebraska (Bruner), Wyoming (Thomas), the Yellowstone region (Bruner), Montana (Thomas), and Washington (Bruner).

The species varies much in coloring, from nearly immaculate to markedly maculate, and also in the length of the tegmina, which, though rarely as short as the hind femora, may sometimes far surpass them in length.

Aulocara parallelum sp. nov.

Head well rounded, rather large and prominent, cinereo-testaceous, feebly infuscated above, and with a broad and broadening postocular, blackish fuscous stripe, extending over the prozona; summit tumid, the fastigium depressed, with well elevated margins, rather longer than broad, at least in the male, the lateral margins parallel, the front acutangulate, particularly in the male; lateral foveolæ triangular, elongate, tolerably well impressed, with coarse raised margins; frontal costa not very broad, in the male much constricted above and gradually broadening, percurrent and rather deeply sulcate, in the female subequal, obsolete below, faintly sulcate at and below the ocellus. Pronotum dull testaceous, with the postocular stripe mentioned, very broad in front and rapidly narrowing, sometimes extended over the metazona on the upper margin of the lateral lobes, feebly constricted mesially, the metazona plane, the hind margin very broadly obtusangulate, the median carina distinct and percurrent, but feeble or obsolete between the sulci, the lateral carinæ diverging, and not greatly, only behind, so that the disk is subequal in width. Tegmina extending to tip of abdomen, well rounded, testaceous, more or less infuscated along the median area and especially in the proximal half; wings hyaline, the veins glaucous except apically in anterior area where they are fuscous. Hind legs lost in only specimens seen.

Length of body, ♂, 19 mm., ♀, 28 mm.; tegmina, ♂, 13.5 mm., ♀, 20 mm.

1 ♂, 1 ♀. Salt Lake Valley, Utah, Aug. 1–4.

This species is remarkable for the parallelism of the lateral carinæ on the prozona, giving a disk of subequal width, and for the lack of decussate markings, combined with the presence of a broad postocular stripe.